

AI Planning

Exercise Sheet 3

Date: 13.11.2014
 Students: Axel Perschmann, Tarek Saier

Exercise 3.1

See hand written notes.

Exercise 3.2

(d=dancing, h=at-home, w=work, ro=romeo, ju=juliet)

We start at: $\gamma = ju-d \wedge ro-h$

We want to reach: $I = \{ro-h \mapsto 1, ju-h \mapsto 1\}$

Operators: $go-d, go-w, go-h$

$$\begin{aligned} regr_{go-w}(\gamma) &= ro-h \wedge \\ &((EPC_{ju-d}(e_{go-w}) \vee (ju-d \wedge \neg EPC_{\neg ju-d}(e_{go-w}))) \wedge \\ &(EPC_{ro-h}(e_{go-w}) \vee (ro-h \wedge \neg EPC_{\neg ro-h}(e_{go-w}))) \\ &) \wedge \kappa \end{aligned}$$

$$\begin{aligned} regr_{go-w}(\gamma) &= ro-h \wedge \\ &((\perp \vee (ju-d \wedge \top)) \wedge \\ &(\perp \vee (ro-h \wedge \perp)) \\ &) \wedge \kappa \end{aligned}$$

$$\begin{aligned} regr_{go-w}(\gamma) &= \perp \\ \Rightarrow \gamma &\text{ is not reachable by means of } go-w \end{aligned}$$

$$\begin{aligned} regr_{go-h}(\gamma) &= ro-w \wedge \\ &((\perp \vee (ju-d \wedge \top)) \wedge \\ &(EPC_{ro-h}(e_{go-h}) \vee (ro-h \wedge \neg EPC_{\neg ro-h}(e_{go-h}))) \\ &) \wedge \kappa \end{aligned}$$

$$\begin{aligned} regr_{go-h}(\gamma) &= ro-w \wedge \\ &((\perp \vee (ju-d \wedge \top)) \wedge \\ &\top \\ &) \wedge \kappa \end{aligned}$$

$$\begin{aligned} regr_{go-h}(\gamma) &= ro-w \wedge ju-d \\ \Rightarrow \gamma &\text{ is reachable from } ro-w \wedge ju-d \text{ by means of } go-h \end{aligned}$$

//Note: less verbose from this point onwards.

$$\begin{aligned} regr_{go-d}(\gamma) &= ju-h \wedge \top \wedge (\perp \vee (ro-h \wedge \neg ro-h)) \wedge \kappa = \perp \\ \Rightarrow \gamma &\text{ is not reachable by means of } go-d \end{aligned}$$

\Rightarrow the only node to expand from is $n_1 = ro-w \wedge ju-d$

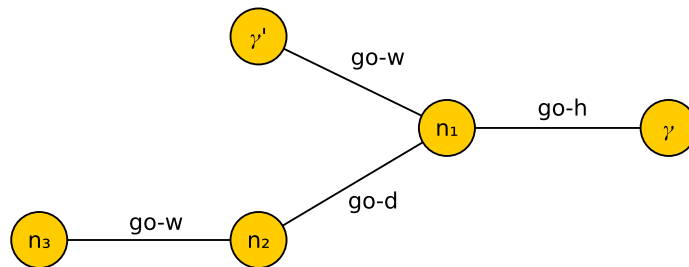
$regr_{go-w}(n_1) = ro-h \wedge ju-d$ (similar to γ , no further expansion)

$regr_{go-h}(n_1) = \perp$

$regr_{go-d}(n_1) = ro-w \wedge ju-h$ ($= n_2$)

$regr_{go-w}(n_2) = ro-h \wedge ju-h$ ($= n_3 \models I$)

Resulting search tree:



Resulting plan:

$go-w, go-d, go-h$